

CHICAGO FORECAST DISTRICT.

A cold wave appeared in the extreme Northwest on the morning of the 12th, which gradually extended, with increasing intensity over the entire district. Its force was broken in the extreme Northwest on the 20th and over the eastern and central portions of the district on the 21st and 22d. For long duration and low temperature it was the most remarkable cold wave that has prevailed in the district so early in the winter season for twenty-five years. The shipment of perishable goods was at a standstill. Warnings were issued well in advance, almost without exception, throughout all portions of the forecast district, and the benefits derived from the information were undoubtedly very great. The most severe storm of the month on the upper lakes accompanied the approach of this cold wave during the 13th and 14th. Considering the severity of the storm, comparatively few wrecks were reported and it is thought that most of the vessels sought shelter as soon as the warnings were observed.

On the night of the 21st the car ferry *Muskegon* was wrecked in making the entrance to the harbor at Ludington, Mich., while high southwest wind was prevailing. Warnings for high winds had been sent to the west shore of the lake before the departure of the *Muskegon*, but car ferries of this character, as a rule, make trips across the lake in the most severe storms, and generally find no difficulty in making a passage in a storm of ordinary character, such as the one of the 21st and 22d.—*H. J. Cox, Professor.*

NEW ORLEANS FORECAST DISTRICT.

Severe weather conditions occurred over this district in December. Very well-marked cold waves crossed the district during the month, for which warnings were issued, as a rule, forty-eight hours in advance of the occurrence of verifying temperatures. Special temperature warnings were issued for the benefit of the sugar planters. The warnings were of great value.—*I. M. Cline, Forecast Official.*

DENVER FORECAST DISTRICT.

The month was characterized by mild weather. This temperature condition so favorable to live stock interests was interrupted, however, on the 11th and 12th, when a cold wave extended over the district. Special warnings of snow and cold weather were sent to live stock and railroad interests, and warnings of freezing temperature were telegraphed to points in Arizona. Live stock interests sustained no material loss.—*F. H. Brandenburg, Forecast Official.*

PORTLAND, OREG., FORECAST DISTRICT.

Two storms of great severity crossed the district during December. Both were successfully forecast, and warnings were sent to all seaports eight to twelve hours before the high winds began. Several lives were lost and many shipwrecks and other casualties occurred during the gales. The ship disasters were confined almost exclusively to the inward bound fleet, and, so far as known, no seagoing vessels left port after warnings were issued.—*Edward A. Beals, Forecast Official.*

HAVANA, CUBA, FORECAST DISTRICT.

On December 14 a warning of strong northwest winds and lower temperature was received from Washington and

disseminated throughout the island; the forecast was amply verified. Conditions did not warrant the issue of warnings or advices at any other time during the month.—*W. B. Stockman, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.....	1, a.m.	53	108	2, a.m.	41	97	1,000	2.0	500	30.8
II.....	2, a.m.	50	100	7, p.m.	48	69	1,700	5.5	309	12.9
III.....	4, a.m.	37	123	8, p.m.	34	78	2,000	6.5	308	12.8
IV.....	6, a.m.	35	121	9, a.m.	39	108	1,000	1.0	1,000	41.7
V.....	11, p.m.	51	120	14, a.m.	47	54	5,525	8.0	690	28.8
VI.....	15, a.m.	47	122	20, p.m.	46	69	3,650	6.0	608	25.3
VII.....	18, p.m.	51	104	23, a.m.	32	65	3,925	4.5	872	32.6
VIII.....	25, a.m.	37	100	27, a.m.	46	60	3,200	2.0	1,600	66.7
IX.....	25, a.m.	43	123	28, p.m.	46	60	4,000	3.5	1,143	47.6
X.....	27, a.m.	43	123	30, a.m.	39	108	1,100	3.0	367	15.3
XI.....	30, a.m.	54	114	2, p.m.*	32	81	2,750	3.5	786	32.8
Sums.....							34,150	51.0	8,965	373.6
Mean of 13 paths.....							2,846		747	31.1
Mean of 51.0 days.....									670	27.9
Low areas.										
I.....	3, p.m.	48	125	5, a.m.	47	104	1,300	1.5	867	36.1
II.....	5, a.m.	43	123	7, a.m.	47	89	1,900	2.0	950	39.6
III.....	6, a.m.	33	115	9, a.m.	45	74	3,050	3.0	1,017	42.8
IV.....	7, p.m.	54	114	10, a.m.	48	68	3,800	4.5	844	35.2
V.....	11, a.m.	33	115	9, a.m.	46	96	1,050	1.5	700	29.2
VI.....	12, a.m.	50	97	16, p.m.	46	60	3,850	5.5	700	29.2
VII.....	21, a.m.	53	105	26, a.m.	47	54	2,800	4.5	622	25.9
VIII.....	23, p.m.	44	104	25, a.m.	42	76	3,000	5.0	600	25.0
IX.....	26, a.m.	47	89	27, p.m.	46	60	1,800	1.5	1,200	50.0
	27, p.m.	29	95	31, a.m.	47	54	1,950	1.5	1,300	54.2
							2,600	3.5	743	31.0
Sums.....							27,100	34.0	9,548	397.7
Mean of 11 paths.....							2,464		867	36.2
Mean of 34.0 days.....									797	33.2

*January.

For graphic presentation of the movements of these highs and lows see Charts I and II.—*Geo. E. Hunt, Chief Clerk Forecast Division.*

RIVERS AND FLOODS.

The upper Mississippi River was frozen over from Hannibal, Mo., northward at the end of the month, the dates of closing varying from the 3d, at St. Paul, Minn., to the 17th, at Keokuk, Iowa. On the 14th the usual winter gorge formed at the Wabash bridge, Hannibal, Mo., and on the 16th the river was blocked for a single day at Grafton, Ill. At Chester, Ill., it was blocked from the 18th to the 26th, inclusive. On the latter date, the U. S. S. *King* broke the gorge. Back of the city of Cairo, Ill., the river froze on the 19th and did not open again until the 26th.

At the end of November, 1901, running ice had been observed as far south as Dubuque, Iowa. It first appeared at Davenport, Iowa, on the 9th of December, and by the 20th had reached Memphis, Tenn., where, from the 20th to the 23d, inclusive, it was present in such quantities as to seriously interfere with navigation. The ice reached Arkansas City, Ark., in large quantities on the 23d, but none was reported at Greenville, Miss., the next station below.

The Red River of the North closed at Moorhead, Minn., on the 2d. In the Missouri River ice was first reported at Sioux City, Iowa, on the 5th, and navigation was closed on the 17th. At Omaha, Nebr., the river was first frozen over on the 13th.